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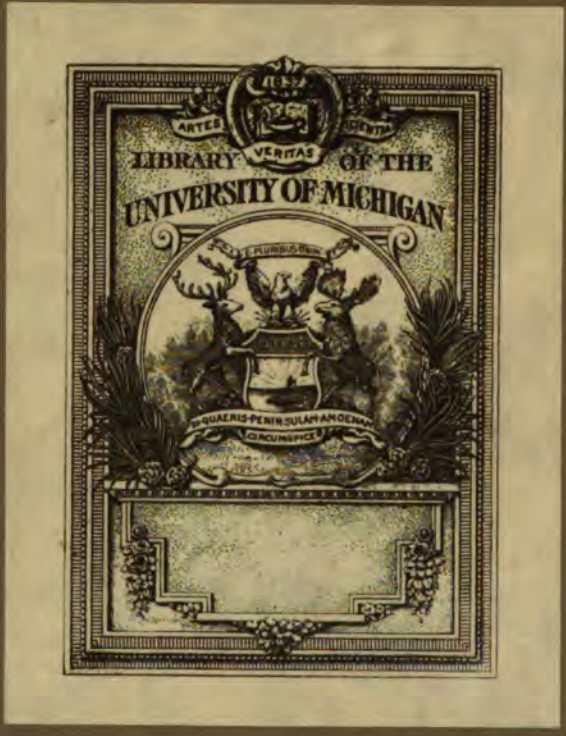
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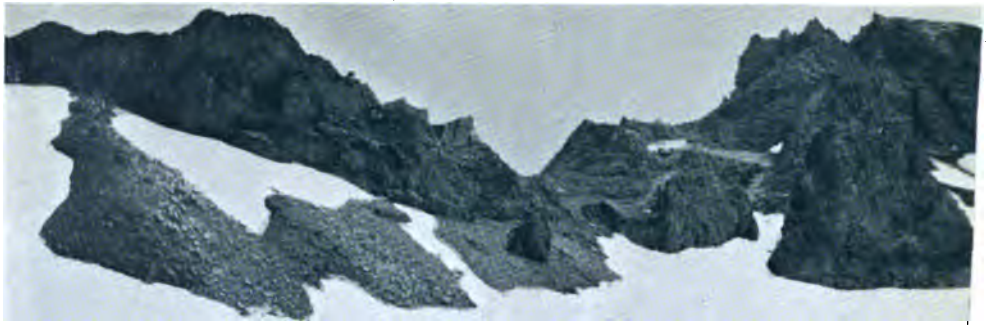

St. Elmo Pass, between Winthrop Glacier and Interglacier. View from North side.

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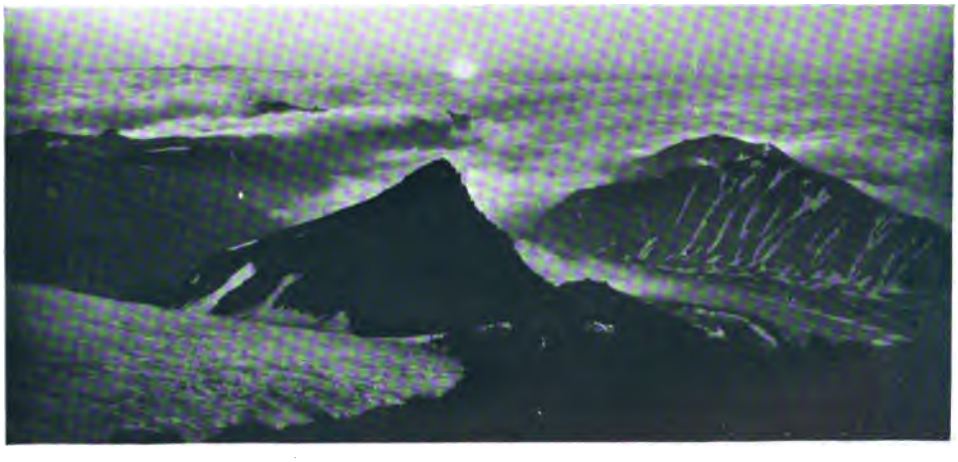

Sunrise above the clouds, seen from Camp Curtis, on the Wedge, with White Glacier below.

THE MOUNTAIN THAT WAS "GOD" BEING A LITTLE BOOK ABOUT THE GREAT PEAK WHICH THE INDIANS CALLED "TACOMA" BUT WHICH IS OFFICIALLY NAMED "RAINIER"

BY

JOHN H. WILLIAMS

O, rarest miracle of mountain heights,
Thou hast the sky for thy imperial dome,
And dwell'st among the stars all days and nights,
In the far heavens familiarly at home.
—William Hillis Wynn: "Mt. Tacoma; an Apotheosis."

TACOMA
Published by the Author
1910

Narada Falls, 175 feet, with Eagle Peak. It has been proposed to change the name to Cushman Falls, in recognition of the late F. W. Cushman's work in Congress for the Government Road, which passes near the falls.

Copyright, 1910 by John H. Williams

On the summit of Eagle Rock in winter. Boys looking over an 800-foot precipice.

FOREWORD

Every summer there is demand for illustrated literature describing the mountain variously called "Rainier" or "Tacoma." Hitherto, we have had only small collections of pictures, without text, and confined to the familiar south and southwest sides.

The little book which I now offer aims to show the grandest and most accessible of our extinct volcanoes from all points of view. Like the glacial rivers, its text will be found a narrow stream flowing swiftly amidst great mountain scenery. Its abundant illustrations cover not only the giants' fairyland south of the peak, but also the equally stupendous scenes that await the adventurer who penetrates the harder trails and climbs the greater glaciers of the north and east slopes. No book will ever be large enough to tell the whole story. That must be learned by summers of severe though profitable toil.

The heroic features which the ice-streams have carved upon the face of Mount "Big Snow," with their fascinating "parks" and flower-fields, their silvery cascades and gray glacial torrents, are every year becoming more friendly to visitors. Each summer sees more and better trails. The capital highway built by Pierce County through the Nisqually valley to the Forest Reserve and the road made by the government engineers up to the Nisqually glacier and the Paradise country have already opened a wonderland to the automobilist. Both these roads, however, should be widened; and the government road should, by all means, be continued around the Mountain, crossing the canyons below each glacier, and winding up to the glorious table-lands above. It will be a great day for the lover of the mountains when Congress, awakening to the value of the whole Park, shall make it easy to know all the charm and inspiration of this priceless national playground.

The title adopted for the book has reference, of course, to the Indian nature worship, of which something is said in the opening chapter. Both the title and a small part of the matter are reprinted from an article which I contributed last year to the New York Evening Post. Attention is called to the tangle in the names of glaciers and the need of a definitive nomenclature. As to the name of the Mountain itself, that famous bone of contention between two cities, I greatly prefer "Tacoma," one of the several authentic forms of the Indian name used by different tribes; but I believe that "Tahoma," proposed by the Rotary Club of Seattle, would be a justifiable compromise, and satisfy nearly everybody. Its adoption would free our national map from one more of its meaningless names — the name, in this case, of an undistinguished foreign naval officer whose only connection with our history is the fact that he fought against us

during the American Revolution. Incidentally, it would also free me from the need of an apology for using the hybrid "Rainier - Tacoma"!

The purpose of the book, however, is descriptive rather than controversial. Its plan leaves most of the story to the illustrations, with their explanatory "underlines." I have cut down the text in order to make room for the largest possible number of pictures. In selecting these, several thousand negatives and photographs have been examined. The ones used here include many noteworthy views never before shown in any publication — pictures that tell a great story. Conditions met by every photographer of ice scenes make it difficult, sometimes, to obtain perfect copy for the engraver. The collection as a whole, however, is as representative as can be made till some of the glaciers shall have been more fully explored. Owing to the disproportion of cuts to text, it has not always been possible to follow a logical order in placing the illustrations; but the full descriptions given, together with the map, will aid the reader to form a clear idea of the geography of the National Park and the characteristic aspects of the peak. I shall be grateful for correction of any errors, and for information as to photographs that may add to the value of future editions.

Many of the illustrations show wide reaches of wonderful country, and their details may well be studied with a reading glass.

I am much indebted to the librarians and their courteous assistants at the Seattle and Tacoma public libraries; also to Prof. Flett for his interesting account of the flora of the National Park; to Mr. Eugene Ricksecker, of the United States Engineer Corps, for permission to reproduce his new map of the Park, now printed for the first time; and, most of all, to the photographers, both professional and amateur. In the table of illustrations, pages 11 to 13, credit is given the maker of each photograph.

The book is sent out in the hope of promoting a wider knowledge of our country's noblest landmark. May it lead many of its readers to delightful days of recreation and adventure!

Tacoma, June 1, 1910. J. H. W.

The Mountain from Puyallup River, near Tacoma.

White Glacier and Little Tahoma, with Eastern end of the Tatoosh in distance.

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Copyright, 1900, by A. H. Waite

Basaltic Columns, part of "the Colonnade" on south side of South Mowich Glacier. These curious six-sided columns of volcanic rock, about 150 feet high, are similar to those bordering the Cowlitz Glacier.

Crevasses in Stevens Glacier, with Cowlitz Glacier and the Cowlitz Park country beyond.

View from above Sluiskin Falls, at 3 p. m.

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From above Sluiskin Falls, at 4 p. m., showing the approach of a storm. Taken same day as preceding view.

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The Mountain from beautiful Lake Washington, Seattle.

Copyright, 1909, by Asahel Curtis

Lost to the World, 7,500 feet above sea level.

THE MOUNTAIN THAT WAS "GOD."

I.

MOUNT "BIG SNOW" AND INDIAN TRADITION.

Age cannot wither her, nor custom stale
Her infinite variety.—Antony and Cleopatra.

THE great mountain fascinates us by its diversity. It is an inspiration and yet a riddle to all who are drawn to the mysterious or who love the sublime. Every view which the breaking clouds vouchsafe to us is a surprise. It never becomes commonplace, save to the commonplace.

Old Virgil's gibe at mankind's better half — "varium et mutabile semper femina" — might have been written of this fickle shape of rock and ice and vapor. One tries vainly, year after year, to define it in his own mind. The daily, hourly change of distance, size and aspect, tricks which the Indian's mountain god plays with the puny creatures swarming more and more about his foot, his days of frank neighborliness, his swift transformations from smiles to anger, his fits of sullenness and with-

Crossing a Snow Slope, upper part of Moraine Park.

Iron and Copper Mountains (right) in Indian Henry's. The top of Pyramid Peak shows in the saddle beyond, below Peak Success.

drawal, all baffle study. Even though we live at its base, it is impossible to say we know the mountain, so various are the spells the sun casts over this huge dome which it is slowly chiseling away with its tools of ice, and which, in coming centuries, it will level with the plain.

We are lovers of the water as well as the hills, out here in this Northwestern corner of the Republic. We spend many days — and should spend more — in cruising among the hidden bays and park-like islands which make Puget Sound the most interesting body of water in America. We grow a bit boastful about the lakes that cluster around our cities. Nowhere better than from sea level, or from the lakes raised but little above it, does one realize the bulk, the dominance, and yet the grace, of this noble peak. Its impressiveness, indeed, arises in part from the fact that it is one of the few great volcanic mountains whose entire height may be seen from tide level. Many of us can recall views of it from Lake Washington at Seattle, or from American or Spanaway Lake at Tacoma, or

Ice Terraces on South Tahoma Glacier. These vast steps are one of the formations seen when a glacier moves down a steep and irregular slope.

Copyright, 1900, by A. H. Waite

North Peak and South Mowich Glacier in Storm, seen from an altitude of 6,000 feet, on ridge between North Mowich and Puyallup Glaciers. The Glacier, 2,000 feet below, is about half a mile wide. Note the tremendous wall of ice in which it ends.

from the Sound, which will always haunt the memory.

Early one evening, last summer, I went with a friend to Point Defiance, Tacoma's fine park at the end of the promontory on which the city is built. We drank in refreshment from that scene of broad channels and evergreen shores. We watched the gathering colors in the West, over the Olympics. As sunset approached, we rowed far out Northward into the Sound. The Western sky became a conflagration. Twilight settled upon the bay. The lights of the distant town came out, one by one, and those of the big smelter, near by, became brilliant. No Turner ever dreamed so glorious a picture of sunlight and shade. But we were held by one vision.

Yonder, in the Southeast, towering above the lower shadows of harbor and hills, rose a vast pyramid of soft flame. The setting sun had thrown a mantle of rose pink over the ice of the glaciers and the great cleavers of rock which buttress the mighty dome. The rounded summit

"Ghost Trees." These white stalks, seen in Indian Henry's and Paradise Valley, tell of fires set by careless visitors.

Mountain Goat, an accidental snap-shot at a distance of 100 feet.

was warm with beautiful orange light. Soon the colors upon its slope changed to deeper reds, and then to amethyst, and violet, and pearl gray. The sun-forsaken ranges below fell away to dark neutral tints. But the fires upon the crest burned on, deepening from gold to burnished copper, a colossal beacon flaming high against the sunset purple of the Eastern skies. Finally, even this great light paled to a ghostly white, as the supporting foundation of mountain ridges dropped into the darkness of the long Northern twilight, until the snowy summit seemed no longer a part of earth, but

View from Electron, showing west side of the Mountain, with a vast intervening country of forested ranges and deep canyons

Scanned

a veil of uncanny mist, caught up by the winds from the Pacific and floating far above the black sky-line of the solid Cascades, that

> * * * heaven-sustaining bulwark, reared
> Between the East and West.

And when even this apparition had faded, and the Mountain appeared only as a dim bulk silhouetted upon the night, then came the miracle. Gradually, the East, beyond the great hills, showed a faint light. The profile of the peak became more definite. With no other warning, suddenly from its summit the full moon shot forth, huge, majestic and gracious, flooding the lower world with brightness. Clouds and mountain ranges alike shone with its glory. But the great peak loomed blacker and more sullen. Only, on its head, the wide crown of snow gleamed white under the cold rays of the moon.

No wonder that this mountain of changing moods, overtopping every other eminence in the Northwest, answered the idea of God to the simple, imaginative mind of the Indians who hunted in the forest on its slopes or fished in the waters that ebbed and flowed at its base. Primitive peoples in every land have deified superlative manifestations of nature — the sun, the wind, the great rivers and waterfalls, the high mountains. By all the tribes within sight of its summit, this preeminent peak, called by them Tacoma, Tahoma or Tacob, as who should say "The Great Snow," was deemed a power to be feared and conciliated. Even when the missionaries taught them a better faith, they

Waterfall over island of rock, middle of Stevens Glacier. Note the Ice Wall above.

View South from Cowlitz Glacier; elevation, 8,000 feet. Seven miles away are the huge eastern peaks of the Tatoosh. The Cascades beyond break in Cispus Pass, and rise, on the left, to snow-peaks called "Goat Rocks," but deserving a better name. The truncated cone of Mt. Adams, more than forty miles away, crowns the sky-line.

continued to hold the mountain in superstitious reverence — an awe that still has power to silence their "civilized" and very unromantic descendants.

Storm King Peak and Mineral Lake, viewed from near Mineral Lake Inn.

The Puget Sound tribes, with the Yakimas, Klickitats and others living just beyond the Cascades, had substantially the same language and beliefs, though differing in physical type. East of the range, they lived by the chase. They were great horsemen and famous runners, a breed of lithe, upstanding, handsome men. Here on the Coast were the "Digger" tribes, who subsisted chiefly by spearing salmon and digging clams. Their stooped figures, flat faces, downcast eyes and low mentality reflected the life they led. Contrasting their heavy bodies with their feeble legs, which grew shorter with disuse, a Tacoma humorist last summer gravely proved to a party of English visitors that in a few years more, had not the white man seized their fishing grounds, the Siwashes would have had no legs at all.

Mineral Lake and the Mountain.

Stolid as he seemed to the whites, the Indian of the Sound was not without his touch of poetry. He had that imaginative curiosity which marked the native American

Snow Lake in Indian Henry's, surrounded by Alpine Firs, which grow close to the Snow Line. Elevation about 6,000 feet.

Cowlitz Glacier, Crevasses caused by flexure in its bed

everywhere. He was ever peering into the causes of things, and seeing the supernatural in the world around him. *

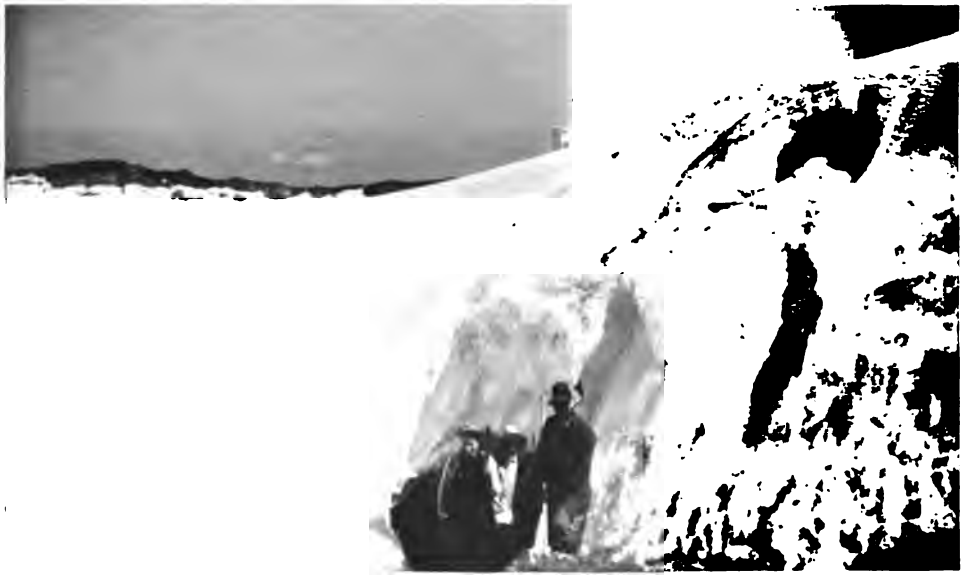
To the great Snow Mountain the Indians made frequent pilgrimages, for they thought this king of the primeval wild a divinity to be reckoned with. They dreaded its anger, seen in the storms about its head, the thunder of its avalanches, and the volcanic flashes of which their traditions told. They courted its favor, symbolized in the wild flowers that bloomed on its slope, and the tall grass that fed the mowich, or deer.

As they ascended the vast ridges, the grandeur about them spoke of the

* Among those who have studied the Puget Sound Indians most sympathetically is the Rev. Mr. Hylebos of Tacoma. He came to the Northwest in 1870, when the Federal census gave the sawmill hamlet of Tacoma a white population of seventy-three, and while the Indians hereabout numbered thousands. In those days, says Father Hylebos, the Tacoma tideflats, now filled in for mills and railway terminals, were covered each autumn with the canoes of Indians, spearing salmon for their winter's supply. It was no uncommon thing to see at one time on Commencement Bay 600 boats, 1,800 fishermen. This veteran worker among the Siwashes (French, sauvages) first told me the myths that hallowed the mountain for every native, and the true meaning of the beautiful Indian word "Tacoma." He knew well all the leaders of the generation before the railways: Sluiskin, the Klickitat chief who guided Stevens and Van Trump up to the snow line when they made the first ascent in 1870; Stanup, chief of the Puyallups; Kiskax, head of the Cowlitz tribe; Angeline, the famous daughter of Chief Seattle, godfather of the city of that name, and many others.

mountain god. There were groves of trees he must have planted, so orderly were they set out. The lakes of the lofty valleys seemed calmer than those on the prairies below, the foliage brighter. The song of the waterfalls here was sweeter than the music of the tamahnawas men, their Indian sorcerers. The many small meadows close to the snow-line, carpeted in deepest green and spread with flowers, were the gardens of the divinity, tended by his superhuman agents. No wood in ancient Greece was ever peopled by hamadryads so real as the little gods whom the Indian saw in the forests watered by streams from Tacoma's glaciers.

Paradise River, below its Glacier, with Little Tahoma in distance.



Steam Caves in one of the Craters. The residual heat of the extinct Volcano causes steam and gases to escape from vents in the rims of the two small Craters. Alpinists often spend a night in the Caves thus formed in the Snow.

West Side of the Summit, seen from Tahoma Fork of the Nisqually. Note the whiteness of the Glacial Water

View from Beljica. This great picture shows the deeply indented West Side of the Mountain. Beginning at extreme right, the Glaciers are, successively: Kautz, South Tahoma, North Tahoma and Puyallup. In the foreground is the Canyon of Tahoma Fork of the Nisqually.

Great Rock on the Ridge separating the North and South Tahoma Glaciers, with Tahoma Fork of the Nisqually several miles below. Seen right of center on page 28.

Countless snows had fallen since the mountain god created and beautified this home of his, when one day he grew angry, and in his wrath showed terrible tongues of fire. Thus he ignited an immense fir forest on the south side of the peak. When his anger subsided, the flames passed, and the land they left bare became covered with blue grass and wild flowers — a great sunny country where, before, the dark forest had been. Borrowing a word from the French coureurs des bois who came with the Hudson's Bay Company, the later Indians sometimes called this region "the Big Brulé"; and to this day some Americans call it the same. But for the Big Brulé the Indians had, from ancient times, another name, connected with their ideas of religion. It was their Saghalie Illahe, the "Land of Peace," Heaven. Our name, "Paradise Valley," given to the beautiful open vale on the south slope of the mountain, is an English equivalent.

Here was the same bar to violence which religion has erected in many lands. The Hebrews had their "Cities of Refuge." The pagan ancients made every altar an asylum. Mediaeval Christianity constituted all its churches sanctuaries. Thus, in lawless ages, the hand of vengeance was stayed, and the weak were protected.

Wind Swept Trees on North Side, the last below the line of Eternal Snow

So, too, the Indian tradition ordained this home of rest and refuge. Indian custom was an eye for an eye, but on gaining this mountain haven the pursued was safe from his pursuer, the slayer might not be touched by his victim's kindred. When he crossed its border, the warrior laid down his arms. Criminals and cowards, too, were often sent here by the chiefs to do penance.

The mountain divinity, with his under-gods, figures in much of the Siwash folk-lore, and the "Land of Peace" is often heard of. It is through such typical Indian legends as that of the Greedy Hiaqua Hunter that we learn how large a place the great Mountain filled in the thought of the aborigines.

This myth also explains why an Indian could never be persuaded to make the ascent, farther than the snow line. Even so shrewd and intelligent a Siwash as Sluiskin, with all his keenness for "Boston chikamin," the white man's money, refused to accompany Stevens and Van Trump, in 1870; and indeed gave them up as doomed when they defied the Mountain's wrath and started for the summit in spite of his warnings.

Exploring an Ice Cave, Paradise Glacier.

The hero of the Hiaqua Myth is the Indian Rip

View of Peak Success and West side of the Mountain from Indian Henry's, with reflection.

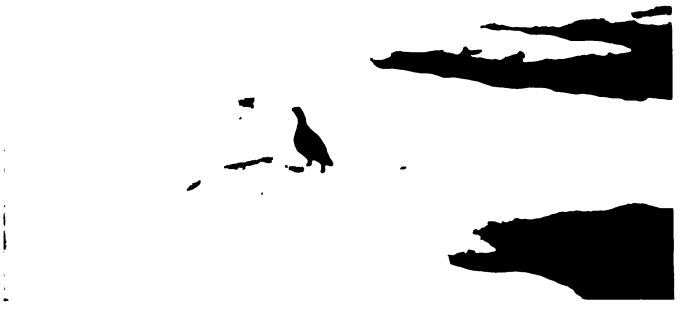
Rounded Cone of Mt. St. Helens, seen from Indian Henry's, 50 miles away.

The Mountain, seen from top of the Cascades, with party starting due West for Paradise Valley.

Van Winkle. * Crazy for hiaqua, or shell money, and persuaded by Moosmoos, the elk divinity, his own totem, that on top of the mountain he would find great store of it, he climbed to the summit. Here he found three big rocks, one of which looked like his friendly Moosmoos. Overturning this after long digging, he uncovered many strings of hiaqua —enough to make him the richest of men. But he meanly seized it all, leaving no thank-offering to the tamahnawas powers. Thereupon the whole earth shook with a mighty convulsion, and the Mountain shot forth terrible fires and poured streams of water (lava?) down its sides.

Panic-stricken at the results of his greed, the man threw down his load of treasure to propitiate the angry deity; and then fell on the ground and entered the land of sleep. Long, long after, he awoke to find himself far from the summit, in a pleasant country of beautiful meadows, carpeted with flowers, and musical with the song of birds. He had grown very old, with snow-white hair falling to his shoulders. Recognizing the scene about him as Saghalie Illahe, he sought his old tent. It was where he had left it, and there, too, was his "klootchman," or wife, grown old, like himself. Back they went to their home on the bank of the Cowlitz, where they spent the rest of their days in great honor. For his tribesmen recognized that the aged Indian's heart had

* See Prof. W. D. Lyman's papers on the Indian legends, in "Mazama," Vol. 2, and "The Mountaineer," Vol. 2; also Winthrop's "Canoe and Saddle."



Ptarmigan, the Grouse of the ice-fields. Unlike its neighbor, the Mountain Goat, this bird is tame, and may sometimes be caught by hand. In winter, its plumage turns from brown to white.

been marvélously softened and his mind enriched by his experience upon the mountain. Thus he became the most respected of all the tamahnawas men of his time.

Such legends show the Northwestern Indian, like savages everywhere, mingling his conception of Deity with his ideas of the evil one. Symbolism pervaded his crude but very positive mind. Ever by his side the old Siwash felt the Power that dwelt on Tacoma, protecting and aiding him, or leading him to destruction. Knowing nothing of true worship, his primitive intelligence could imagine God only in things either the most beautiful or the most terrifying; and the more we know the Mountain, the more easily we shall understand why he deemed the majestic peak a factor of his destiny — an infinite force that could, at will, bless or destroy.

Climbing the Ice Terraces of Winthrop Glacier.

Portion of Spray Park, with North Side view of the Mountain, showing Observation Rock and Timber Line. Elevation of Camera, 7,000 feet.

A perilous position on the edge of a great Crevasse. Cowlitz Glacier, near end of Cathedral Rocks.

On Pierce County's splendid scenic road to the Mountain. Passing Ohop Valley.

II.

THE NATIONAL PARK AND HOW TO REACH IT.

There are plenty of higher mountains, but it is the decided isolation — the absolute standing alone in full majesty of its own mightiness — that forms the attraction of Rainier. * * * It is no squatting giant, perched on the shoulders of other mountains. From Puget Sound, it is a sight for the gods, and one feels in the presence of the gods. — Paul Fountain: "The Seven Eaglets of the West" (London, 1905).

THE first explorers to climb the Mountain, forty years ago, were compelled to make their way from Puget Sound through the dense growths of one of the world's greatest forests, over lofty ridges and deep canyons, and across perilous glacial torrents. The hardships of a journey to the timber line were more formidable than any difficulties to be encountered above it.

Even from the East the first railroad to the Coast had just reached San Francisco. Thence the traveler came north to the Sound by boat. The now busy cities of Seattle and Tacoma were, one, an ambitious village of 1,107 inhabitants; the other, a sawmill, with seventy persons living around it. They were

Cowlitz Chimneys, seen from basin below Frying-Pan Glacier.

On the way out from Tacoma the Automobilist sees many scenes like this Old Road near Spanaway Lake

frontier settlements, outposts of civilization; but civilization paid little attention to them and their great Mountain, until the railways, some years later, began to connect them with the big world of people and markets beyond the Rockies.

How different the case today! Six transcontinental railroads now deliver their trains in the Puget Sound cities. These are: The Northern Pacific, which

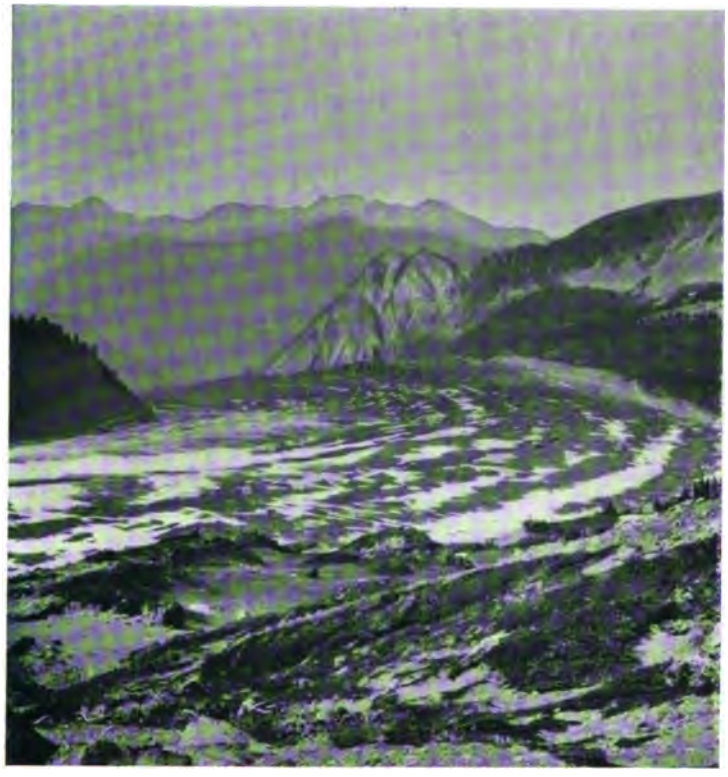
Mystic Lake and Sluiskin Mountains.

Automobile Party above Nisqually Canyon, Pierce County Road to the Mountain.

was the first trunk line to reach the Sound; the Great Northern; the Chicago, Burlington & Quincy; the Chicago, Milwaukee & Puget Sound; the Oregon & Washington (Union Pacific), and the Canadian Pacific. A seventh, the North Coast, will soon be added.

Arriving in Seattle or Tacoma, the traveler has his choice of quick and enjoyable routes to the Mountain. He may go by automobile, leaving either city in the morning. After traveling one of the best and most interesting roads in the country — the first and only one, in fact, to reach a glacier — he may take luncheon at noon six thousand feet higher, in Paradise Park, close to the line of eternal snow. Or he may go by the comfortable trains of the Tacoma Eastern (Milwaukee system) to Ashford, fifty-six miles from Tacoma, and then by automobile stages over a perfect road to the National Park Inn

Prof. O. D. Allen's Cottage, in the Forest Reserve, where the former Yale professor has for years studied the Flora of the Mountain.



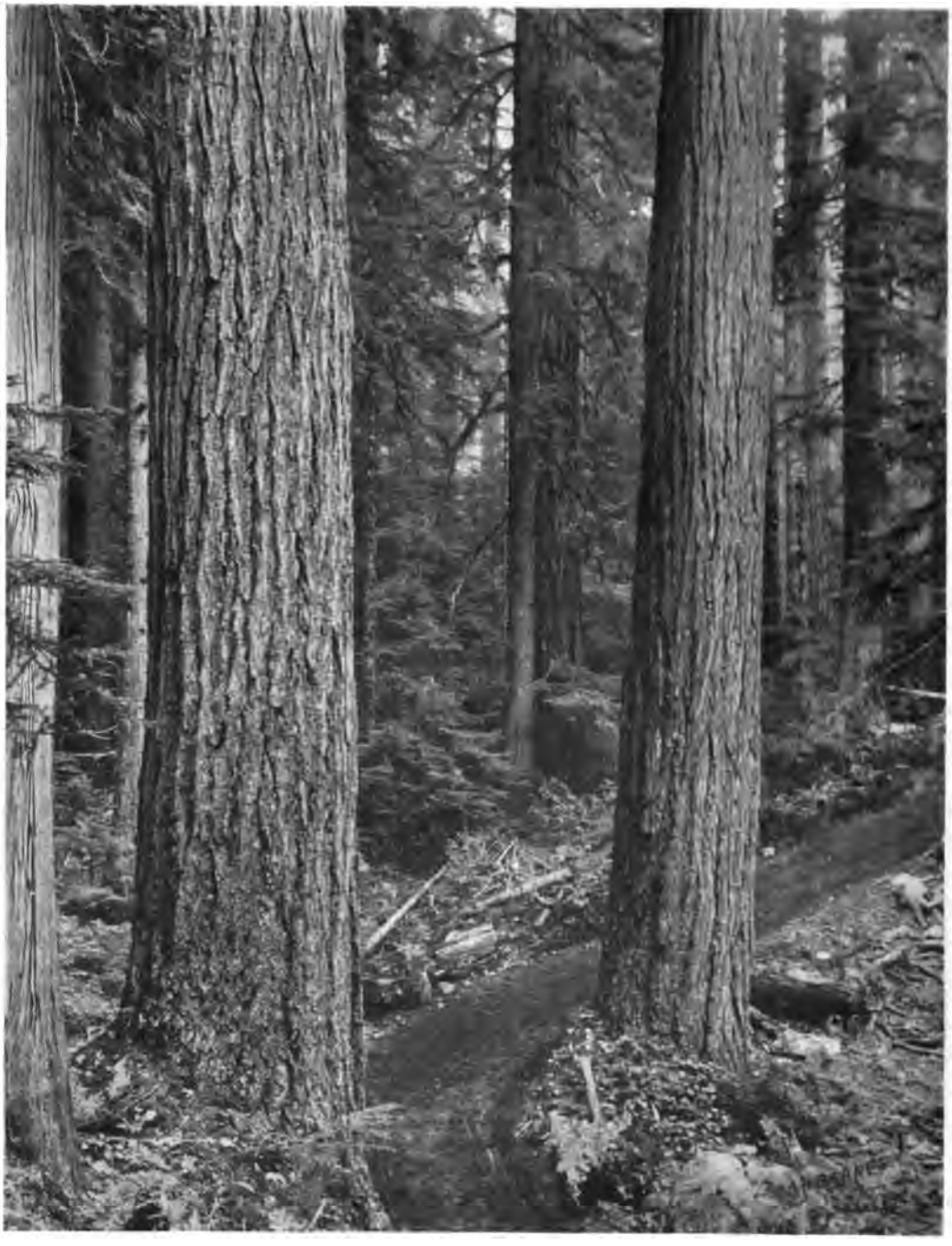
One mile of Carbon Glacier, where it has cut its way through the Mountains. Sluiskin Mountains on right, Mother Mountains on left.

at Longmire Springs (altitude 2,730 feet). Lunching there, he may then go on, afoot, by automobile over the new government road, or on horseback over a romantic trail, to Paradise.

Either of these ways of reaching the Mountain will be a happy choice, for each of them leads through a country of uncommon charm. Each of them, too, will carry the visitor up from the Sound to the great and beautiful region on the southern slopes which includes the Nisqually canyon, Paradise valley, the Tatoosh range, the Stevens canyon, and Indian Henry's Hunting Ground.

Camp on St. Elmo Pass, North side of the Wedge, between Winthrop Glacier and Interglacier. Elevation, 9,000 feet. Winthrop Glacier and the fork of White River which it feeds are seen in distance below. The man is Maj. E. S. Ingraham, a veteran explorer of the Mountain, after whom Ingraham Glacier is named.

Little Mashell Falls, near Eatonville



Old Stage Road to Longmire Springs and the National Park Inn, showing the tall, clear trunks of the giant Firs

Government Road in the Forest Reserve.

Here let him stay a day or a month. Every moment of the time will be crowded with enjoyment. He may content himself with snowballing his companions in midsummer, and with looking down from Alta Vista (elevation, 6,000 feet) on the big Nisqually glacier in the canyon which it has cut for itself, and up its steep slopes to its nevé field, on the summit. Or he may explore this whole region at leisure, climbing hard mountain trails, obtaining magnificent views, working up over the glaciers, studying their crevasses, ice caves and flow. He may even scale the peak, under the safe leadership of experienced guides. He may wander at will over the vast platform left by the prehistoric explosion which truncated the great cone, and perhaps spend a night of sensational novelty (and discomfort) in a big steam cave, under the snow, inside a crater.

The south side has the advantage of offering the wildest alpine sport in combination with a well-appointed hotel as a

Ingraham Glacier emptying into Cowlitz Glacier, over an 800-foot fall, one of the finest ice cascades on the Mountain.

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On the Summit, showing Columbia's Crest, the great Mound of Snow that has, most curiously, formed on this wide wind-swept platform.

base of operations. Hence the majority of visitors to the Mountain know only that side. Everybody should know it, too; but should also know that it is by no means the only side to see.

One may, of course, work around from the Nisqually canyon and Paradise, east or west, to the other glaciers and "parks." It is quite practicable, if not easy, to make the trip eastward from Camp of the Clouds in Paradise Park, crossing Paradise, Stevens and Cowlitz glaciers, and thus to reach the huge White glacier on the east side and Winthrop and Carbon glaciers on the north. Every summer sees more and more visitors making this wonderful journey.

Leaving the National Park Inn at Longmire Springs (elevation, 2,730 feet) for the Summit.

View Northward from top of Pinnacle Peak, 7,200 feet elevation, to Paradise Valley, Nisqually Glacier and Gibraltar Rock, eight miles away

Looking Northeast from slope of Pinnacle Peak, across Paradise, Stevens, Cowlitz and Frying Pan Glaciers.
These two views form virtually a panorama

NAU

On the Government Road a mile above Longmire's.

Another way to reach the great north side, and perhaps the most practicable way, especially for parties which carry camp equipment, is by a Northern Pacific train over the Carbonado branch to Fairfax. This is on Carbon river, five miles from the northwest corner of the National Park. Thence the traveler will go by horse or afoot, over a safe mountain trail, to Spray Park, the fascinating region between Carbon and North Mowich glaciers. Standing here, on such an eminence as Fay Peak or Eagle Cliff, he may have views of the Mountain and its noblest features that will a thousand times repay the labor of attainment.

A visit to this less known side involves the necessity of packing an outfit. But arrangements for horses and packers are easily made, and each year an increasing number of parties make

Glacier Table on Winthrop Glacier. This phenomenon is due to the melting of the glacier, and the consequent lowering of its level save where sheltered by the rock. Under the Sun's rays, these "tables" incline more and more to the South, until they finally slide off their pedestals.

Spray Park their headquarters. From there they go south, over the west side glaciers, or east, across the Carbon and through the great White river country. They camp on the north side of the Sluiskin mountains, in Moraine Park, and there have ready access to Carbon and Winthrop glaciers, with splendid views of the vast precipices that form the north face of the Mountain. Thence they climb east and south over the Winthrop and White glaciers. They visit the beautiful Grand Park and Summer Land, and either make the ascent to the summit from "the Wedge," over the long ice slope of the White glacier, or continue around to the Paradise country and Longmire Springs.

Snout of Nisqually Glacier, with Government Road and Bridge. The Ice Front here is 500 to 600 feet high. Elevation of river flowing forth below is 4,000 feet above sea level.

Washington Torrents, a series of falls seen from the new Government Road to Paradise.

The west side has been less visited than any other, but there is a trail from the North Mowich to the Nisqually, and from this adventurous explorers reach North and South Mowich and Puyallup glaciers. No one has yet climbed the Mountain over those glaciers.

Coming around Frying-Pan Glacier.

or from the north side. A view from any of the trails will explain why. The great rock spines are more precipitous than elsewhere, the glaciers more broken; and the summit is fronted on either side by a huge parapet of rock which hurls defiance at anything short of an airship. Doubtless, we shall some day travel to Crater Peak by aeroplanes, but until these vehicles are equipped with runners for landing and starting on the snow, we shall do best to plan our ascents from the south or east side.

I have thus briefly pointed out the favorite routes followed in exploring the National Park. The time is fast approaching when it will be a truly national

Mt. Adams, seen from the Indian Henry Trail seems a replica of Rainier-Tacoma, as viewed from the west. The distance is about forty miles.

View of Indian Henry's Hunting Ground from a point on South Tahoma Glacier, looking across to Copper and Iron Mountains, with Mt. St. Helens seen above the clouds far beyond. This famous "Park" gets its name from the fact that it was, years ago, the favorite haunt of a celebrated Indian hunter.

Southwest Side of the Mountain as seen from Indian Henry's, showing North and South Tahoma Glaciers meeting in foreground, and Kautz Glacier on extreme right.

Junction of North and South Tahoma Glaciers. The main ice stream thus formed, seen in the foreground, feeds Tahoma Fork of the Nisqually river. The Northern part of North Tahoma Glacier, seen in the distance beyond the wedge of rocks, feeds a tributary of the Puyallup

recreation ground, well known to Americans in every State. The coming of new railways to Puget Sound and the development of new facilities for reaching the Mountain make this certain.*

*For details as to rates for transportation, accommodations and guides, see Note at end of this chapter.

Winthrop Glacier and St. Elmo Pass, with Ruth Mountain (the Wedge) on right and Sour-Dough Mountains on left.

Every step toward making the Park more accessible is a public benefit. Experienced travelers and mountain climbers who have visited it unite in declaring its scenery unequaled in the United States and unsurpassed anywhere in the world.

Portion of Paradise Park and the Tatoosh Range

Until recent years it was known only by the hardy few who delight in doing difficult things. But that day has passed. The value of the Park to the whole American people is coming more and more to be appreciated, both by them and by their official representatives. While Congress has dealt less liberally with this than with the other great National Parks, what it has appropriated has been well spent in building an invaluable road. This is a continuation of the well-made highway maintained by Pierce County from Tacoma, which passes through a delightful country of partly wooded prairies and up the heavily forested slopes to the edge of the Forest Reserve.

Eastern end of the Tatoosh Range.

These roads have put it with-

in the power of automobilists from all parts of the Coast to reach the grandest of American mountains and the largest glaciers in the United States south of Alaska. They connect, at Tacoma, with excellent roads from Seattle and other cities on the Sound, as well as from Portland and points farther south. The travel from these cities has already justified the construction of the roads, and is increasing every year. Even from California many automobile parties visit the Mountain.

Ice Bridge, Stevens Glacier

Persons who come by rail may, as I have said, choose between the train service of the Tacoma Eastern Railway and a trip by automobile. For those who do not come in their own cars, a line of automobile stages from Tacoma has been established, giving regular and comfortable transportation

Tug of War between teams picked from the feminine contingent of the Mountaineers.

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Ice Cave, Paradise Glacier

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Reese's Camp, which his patrons have poetically called "Camp of the Clouds." A tent hotel on a ridge in Paradise Park, overlooking Nisqually Glacier. This is the usual starting point of parties for the Summit over the South-side route, via Gibraltar.

daily to Longmire Springs, and offering one of the most enjoyable scenic trips to be had anywhere.

The most important movement toward making the Mountain better known and more accessible has just been inaugurated, with good promise of success. It is proposed to extend the new government road, now reaching Paradise Park, to the other "parks" on all sides of the peak. The undertaking is of such importance that it will doubtless receive prompt approval and proper support from Congress.

Climbing Paradise Glacier.

Congressional action for the opening of this great alpine area to public use began in 1899. A tract eighteen miles square, to be known as "Ranier National Park," * was withdrawn from the

* For some years, Congress and the Interior Department spelled it "Ranier"! A well-known Congressman from Seattle put them straight, and it has since been officially "Rainier National Park."

Looking down on Nisqually Glacier from top of Gibraltar Rock, with Storm Clouds veiling the Mountain.

Sluiskin Falls, 150 Feet, just below Paradise Glacier

2,146,600 acres of the Forest Reserve, previously created. The area thus set apart for the enjoyment of the people was already known to enthusiasts and explorers as one of the world's great wonderlands. In 1861 James Longmire, a prospector, had built a trail from Yelm over Mashell mountain and up the Nisqually river to Bear Prairie. This he extended in 1884 to the spot now known as Longmire Springs, and thence up the Nisqually and Paradise rivers to the region now called Paradise Park. Part of this trail was widened later into a wagon road, used for many years by persons traveling to the Paradise country, or seeking health at the remarkable mineral springs on the tract which the Longmires acquired from the government before the establishment of the Forest Reserve.

Looking across Winthrop Glacier from Avalanche Camp, on the East side of Carbon Glacier, to Steamboat Prow (the Wedge) and St. Elmo Pass. Elevation of Camera, about 8,500 feet.

Fairy Falls in Goat Lick Basin. This series of waterfalls has a drop of several hundred feet.

The Longmire road, rough as it was, long remained the best route to the Mountain, but in 1903 the late Francis W. Cushman, representative from this State, persuaded Congress to authorize the survey and construction of a better one. Work was not begun, however, until 1906. The yearly appropriations have been small, and total only $183,000 to the end of 1909.

The road, as now open to Paradise valley, is a monument to the engineering skill of Mr. Eugene Ricksecker, United States Assistant Engineer, in local charge of the work. Over its even floor you go from the west boundary of the Forest Reserve up the north bank of the Nisqually river, as far as the foot of its glacier. Crossing on the bridge here, you climb up and up, around the face of a bluff known as Gap Point, where a step over the retaining wall would mean a sheer drop of a thousand feet into the river below. Thus you wind over to the Paradise river and up through its canyou to the broad and beautiful valley of the same name above, until you reach Camp of the Clouds and its picturesque tent hotel.

The road has brought you a zig-zag journey of twenty-four miles to cover an air-line distance of twelve and a gain in elevation of 3,800 feet. It is probably unique in its grades. It has no descents. Almost everywhere it is a gentle climb. Below Longmire Springs the maximum grade is 2.5 per cent., and the average, 1.6 per cent. Beyond, the grade is steeper, but nowhere more than 4 per cent.

The alignment and grades originally planned have been followed, but only one stretch, a mile and a quarter, has yet been widened to the standard width of eighteen feet. Lacking money for a broader road, the engineers built the rest of it twelve feet wide. They wisely believed that early opening of the

route for vehicles to Paradise, even though the road be less than standard width, would serve the public by making the Park better known, and thus arouse interest in making it still more accessible. It will require about $60,000 to complete the road to standard width, and make it thoroughly secure.

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Checkerboard Crevasses on lower Cowlitz Glacier, with Basalt Cliffs and Cowlitz Park above, and Little Tahoma in distance.

The next step in opening the National Park to public use should be the carrying out of Mr. Ricksecker's fine plan for a road around the Mountain. His new map of the Park, printed at the end of this volume, shows the route proposed. Leaving the present road near Christine Falls, below the Nisqually glacier, he would double back over the hills to Indian Henry's Hunting Ground, thence dropping into the canyon of Tahoma Fork, climbing up to St. Andrew's Park, and so working round to the Mowich glaciers, Spray Falls and the great "parks" of the north side. The snout of each glacier would be reached in turn, and the high pleateaus which the glaciers have left would be visited.

Crossing Moraine Park and Winthrop glacier's old bed, the road would ascend to Grand Park and the Sour-Dough country — a region unsurpassed anywhere on the Mountain for the breadth and grandeur of its views. More descents, climbs and detours would bring it to the foot of White glacier, and thence through Summer Land and Cowlitz Park, and westward to a junction with the existing road in Paradise Park. Its elevation would range between four and seven thousand feet above the sea. The route, as indicated on the map, suggests very plainly the engineering feats involved in hanging roads on these steep and deeply-carved slopes.

Paradise Valley and Tatoosh Mountains, from slope below Paradise Glacier. The high peak left of the center is Pinnacle Peak.

Stevens Canyon in October, with Mt. Adams over Eastern end of Tatoosh Range on right, and Cascades on left. The snow peaks seen on the Cascade Sky-line are "Goat Rocks." Goat Lick Basin is in lower left corner.

Mountain Climbers on St. Elmo Pass, North side of the Wedge. View taken from upper side of the Pass. Elevation, 9,000 feet.

Between eighty and a hundred miles of construction work would be required, costing approximately $10,000 a mile. Including the completion of the present road to standard width, Congress will thus have to provide a round million if it wishes to develop the full value of this vast wonderland. I shall not use any of my little space in trying to prove that this expenditure is worth while. Every Congressman who makes the trip over the new road already built will know it, and know why. Such a road would justify the Congress which authorizes it, immortalize the engineers who build it, and honor the nation that owns it.

NOTE.

Rates, Accommodations, Guides, Etc.—The fare via the Tacoma Eastern Railway from Tacoma to the Mountain is $6 for the round trip, including the automobile-stage ride over the new government road from Ashford to Longmire's and return. Tickets are good for the season. Parties of ten or more, traveling on one ticket, $5 per capita. A week-end ticket, Saturday to Monday, is sold at $5.

Automobile stages seating ten passengers leave the office of the De Lape Tours Company, 110 South Ninth street, Tacoma, for the Mountain every morning during the summer at 7:30, 8 and 8:30 o'clock, reaching Longmire's in 5½ hours. Distance, 70 miles. Returning, they leave Longmire's at 3:30, making the trip down in 4½ hours. The route is over the new Pierce County road above the Nisqually canyon to Ashford and over the government road through the National Park. Fare for the round trip, $7. Reservations should be made in advance.

Automobiles are permitted to enter or leave the National Park only between the hours of 8 a. m. and 6 p. m. An automobile permit must be purchased at the keeper's lodge, at the western boundary of the Park. This costs $5, and is good for the season,

provided that its owner and his machine observe the rules. The speed limit is twelve miles per hour, with six miles on curves. Public safety demands that this rule be strictly enforced — and it is. Persons violating it have the unpleasant experience of losing their permits and finding their cars chained up.

The National Park Inn, Longmire Springs, provides excellent rooms and a good table. In addition to the rooms in the Inn, a large number of well-furnished and comfortable tents are provided near by. The rates range from $2.50 to $3.75 a day, American plan.

At the old Longmire hotel, the rates are $2 to $2.50 for room and board.

The mineral springs are of great variety, and are highly recommended for their medicinal virtues. Within an area of several acres, there are a score of these springs, varying from the normal temperature of a mountain stream almost to blood heat. Well-appointed bath houses are maintained. Fee, including attendance, $1.

The cost of getting from Longmire Springs to Paradise Park or Indian Henry's is moderate. Many prefer to make these trips on foot. Daily parties, with experienced guides, are made up several times a day for the trails to each of these great "parks." Sure-footed horses are provided for those who wish to ride, at $1.50 for the round trip.

A line of stages carries passengers from Longmire's over the government road to Nisqually glacier, Narada Falls and Camp of the Clouds, in Paradise Park. The charge for the trip to Narada and return is $2; to Paradise Park and return, $3.

At Reese's Camp, in Paradise Park, and at the similar tent hotel in Indian Henry's, the charge for meals, with a tent for sleeping, is $2.50 per day.

Guides may be had at the National Park Inn or at either of the "camps" for many interesting trips over the mountain trails. Horses also are furnished. The charge varies with the number in a party.

For those who wish to make the ascent over the Gibraltar trail, trustworthy guides may be engaged at the National Park Inn or at Reese's Camp. Arrangements should be made several days in advance. The cost of such a trip depends upon the number in a party. The guides make an initial charge of $25 for the first member of the party, and $5 each for the others. They will furnish alpenstocks, ropes, and calks for the shoes of mountain climbers at a reasonable charge. Each person should carry with him a blanket or extra coat and a small amount of food, for use in the event of being on the summit over night. Still heavier clothing will be required if the night is to be spent at Camp Muir.

Ascents from other points than Reese's are usually made in special parties, under the guidance of persons familiar with the routes. All persons are warned not to attempt an ascent unless accompanied by experienced guides. Lives have been lost through neglect of this precaution.

For persons visiting the North Side, the Northern Pacific rate from Tacoma to Fairfax is $1.25; and from Seattle to Fairfax, with change of cars at Puyallup, $1.75. Guides and horses may be engaged at Fairfax for the Spray Park trail.

Passing a big Crevasse on Interglacier. Sour-Dough Mountains on the right, with Grand Park beyond. Ruth Mountain (the Wedge) and St. Elmo Pass on left, with Glacier Basin in depression.

The Mountaineers on Winthrop Glacier.

III.

THE STORY OF THE MOUNTAIN

I asked myself, How was this colossal work performed? Who chiseled these mighty and picturesque masses out of a mere protuberance of earth? And the answer was at hand. Ever young, ever mighty, with the vigor of a thousand worlds still within him, the real sculptor was even then climbing up the eastern sky. It was he who planted the glaciers on the mountain slopes, thus giving gravity a plough to open out the valleys; and it is he who, acting through the ages, will finally lay low these mighty monuments, * * * so that the people of an older earth may see mould spread and corn wave over the hidden rocks which at this moment bear the weight of the Jungfrau. —John Tyndall: "Hours of Exercise in the Alps."

The life of a glacier is one eternal grind.—John Muir.

OUR stately Mountain, in its youth, was as comely and symmetrical a cone as ever graced the galaxy of volcanic peaks. To-day, while still young as compared with the obelisk crags of the Alps, it has already taken on the venerable and deeply-scarred physiognomy of a veteran. It is no longer merely an overgrown boy among the hills, but, cut and torn by the ice of centuries, it is fast assuming the dignity and interest of a patriarch of the mountains.

Crossing Carbon Glacier. On the ice slopes, it is customary to divide a large party into companies, with an experienced alpinist at the head of each. The picture shows the Mountaineers marching in tens. Note the Medial Moraines on the Glacier.

Nisqually Glacier, with its sources in the Snow Field of the Summit. On the right is Gibraltar Rock and on the extreme left Kautz Glacier flows down from Peak Success. Note the Medial Moraines, resulting from junction of Ice Streams above. These apparently small lines of dirt are often great ridges of rocks, cut from the cliffs. The picture also illustrates how the marginal crevasses of a glacier point down stream from the center, though the center flows faster than the sides.

Looking North from Cowlitz Chimneys over the Cowlitz Glacier to Gibraltar Rock, with Cathedral Rocks on its right, and the Cowlitz Cleaver, left. Beyond, upon the summit, Peak Success is seen on the left, with Crater Peak and rim of the Crater at top of sky-line. The foreground, cross-seamed with crevasses, tells a graphic story of long travel by the ice stream

Measuring the Ice Flow in the Nisqually Glacier. In 1905 Prof. J. N. Le Conte of Berkeley, Cal., established the fact that this Glacier has an average flow, in summer, of 16.2 inches a day. The movement is greater in the center than on the sides, and greater on the convex side of a curve than on the concave side. It thus is a true river, though a slow one. The measurements are taken by running a line from one lateral moraine to the other with a surveying instrument, setting stakes at short intervals, and ascertaining the advance they make from day to day.

To some, no doubt, the smooth, youthful contours of an active volcano seem more beautiful than the rugged grandeur of the Weisshorn. The perfect cone of Mt. St. Helens, until recently in eruption, pleases them more than the broad dome of Mt. Adams, rounded by a prehistoric explosion. But not so with all. To those who love nature and the story written upon its face, mountains have character as truly as men, and they show it in their features as clearly.

Nowhere is this better exemplified than in the monarch of the Cascades. No longer the huge conical pimple which a volcano erected on the earth's crust, it bears on its face the history of its own explosion, which scattered its top far over the landscape, and of its losing battle with the sun, which, employing the heaviest of all tools, is steadily destroying it. It has already lost a tenth of its height and a third of its bulk. The ice is cutting deeper and deeper into its sides. Upon three of them, it has excavated great amphitheaters which it is ceaselessly driving back toward the heart of the peak. As if to compensate for these losses of size and shapeliness, the Mountain has become the most interesting monument and presents the most important phenomena of glacial action to be seen anywhere in the United States.

In dimensions alone, however, it is still one of the world's great peaks. The Rainier National Park, eighteen miles square, — as large as many counties in the East — has an elevation along its western and lowest boundary averaging four thousnd feet above sea level. Assuming a diameter of only twenty miles, the area covered by the peak exceeds three hundred square miles. Of its vast surface upwards of 32,500 acres, or about fifty-one square miles, are covered by glaciers or the fields of perpetual snow which feed them. A straight line

These views show the larger of the two comparatively modern and small craters on the broad platform left by the
and 1,450 feet from East to West. The other, much smaller, adjoins it so closely that their rims touch.
miles from North Peak (Liberty Cap) and South Peak (Peak Success). At the
Crest." The volcano having long been inactive, the craters are filled

drawn through from the end of North Tahoma glacier, on the west side, to the end of White glacier, on the east, would be thirteen miles long. The circumference of the crest, on the 10,000 foot contour, is nearly seven miles. The twelve primary glaciers vary in length from three to eight miles, and from half a mile to three miles in width. There are as many "inter-glaciers," or smaller ice streams which gather their snow supply, not from the nevé fields of the summit, but below the wedges of rock which the greater glaciers have left standing upon the upper slopes.

The geological story may be told in a few untechnical words. As those folds in the earth which parallel the Coast were slowly formed by the lateral pressure of sea upon land, fractures occurred in the incline thus created. Through the fissures that resulted the subterranean fires thrust molten rock which formed volcanic craters. The most active craters built up, by eruptions of lava and

Climbing the Cowlitz Cleaver to Gibraltar. This Spine is one of the great ridges left by the glaciers. On the other side of it is a drop of several thousand feet to Nisqually Glacier.

explosion which decapitated the Peak. Prof. Flett measured this Crater, and found it 1,600 feet from North to South, Together they form an eminence of 1,000 feet on top of the Mountain, at a distance of more than two junction of their rims is the great snow hill (on right of view) called "Columbia's with snow, but steam and gases escape in places along their rims.

ashes, a great series of cones now seen on both sides of the cordillera, that huge mountain system which borders the Pacific from Behring sea to the Straits of Magellan. Tacoma-Rainier is one of the more important units in this army of volcanic giants.

Unlike some of its companions, however, it owes its bulk less to lava flows than to the explosive eruptions which threw forth bombs and scoriae. It is a mass of agglomerates, with only occasional strata of solid volcanic rock. This becomes evident to one who inspects the exposed sides of any of the canyons, or of the great cliffs, Gibraltar Rock, Little Tahoma or Russell Peak. It is made clear even in such a picture as that on page 77 of this book.

Lunching in a Crevasse, 13,000 feet above the sea. Even Little Tahoma, on the left, is far below.

Ice-bound lake in Cowlitz Park, with top of Little Tahoma in distance.

This looseness of structure accounts for the rapidity with which the glaciers are cutting down the peak. All of them carry an extraordinary amount of debris, to be deposited in lateral or terminal moraines, or dropped in streams which they feed. They are rivers of rock as well as of ice.

That the glaciers of this and every other mountain in the northern hemisphere are rapidly receding, and that they are now mere pygmies compared with their former selves, is well known. What their destructive power must have been when their volume was many times greater may be judged from the moraines along their former channels. Some of these ridges are hundreds of feet in height. As you go to the Mountain from Tacoma, either by the Tacoma Eastern railway or the Nisqually canyon road, you find them everywhere above the prairies. Many of them are covered with forests that must be centuries old.

Even now, diminished as

Crevasses in Cowlitz Glacier, with waterfall dropping from Cowlitz Park, over Basaltic Cliffs.

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Spray Park, from Fay Peak, showing the beautiful region between the Carbon and North Mowich Glaciers

they are, the glaciers are fast transporting the Mountain toward the sea. Wherever a glacier skirts a cliff, it is cutting into its side, as it cuts into its own bed below. From the overhanging rocks, too, debris falls upon the ice stream. Thus the marginal moraines begin to form, on the ice, far up the side of the peak. As the glacier advances, driven by its own weight and the resistless mass of snow above, it is often joined by another glacier, bringing its own marginal moraines. Where the two meet, a medial moraine results. * Some medial moraines are many feet high. Trees are found growing on them. In Switzerland houses are built upon them. Often the debris which they transport, as the ice carries them forward, includes rocks as big as a ship.

Mazamas rounding Gibraltar—a reminiscence of the ascent by the famous Portland Club in 1905. The precipice rises more than 1000 feet above the trail.

A glacier's flow varies from a hundred to a thousand feet or more a year, depending upon its volume, its width, and the slope of its bed. As the decades pass, its level is greatly lowered by the melting of the ice. More and more, earth and rocks accumulate upon the surface, as it travels onward, and are scattered over it by the rains and melting snow. At last, in its old age, when far down

* See illustrations on pp. 68 and 69.

its canyon, the glacier is completely hidden, save where crevasses reveal the ice. Only at its snout, where it breaks off, as a rule, in a high wall of ice, do we realize how huge a volume and weight it must have, far above toward its sources, or why so many of the crevasses on the upper ice fields seem almost bottomless.

These hints of the almost inconceivable mass of a glacier, with its millions of millions of tons, suggest how much of the Mountain has already been whittled and planed away. But here we may do better than speculate. The original surface of the peak is clearly indicated by the tops of the great rocks which have survived the glacial sculpturing. They are from one to two thousand feet high. The best known are Gibraltar and the ridges that stretch downward from it, Cowlitz Cleaver and Cathedral Rocks, making a great inverted V. Eastward of this, another V, with its apex toward the summit, is called Little Tahoma; and beyond, still another, Steamboat Prow, forming the tip of "The Wedge."

Spines of rock like these are found on all sides of the peak. They help us to estimate its greater circumference and bulk before the glaciers had chiseled so deeply into it.

But they do even more. Wherever lava flows occurred in the building of the Mountain, strata formed; and such stratification is clearly seen at wide intervals on the sides of the great rocks just mentioned. Its incline, of course, is that of the former surface. The strata point upward — not toward the summit

Climbing the "Chute" on west side of Gibraltar. This is so steep that the guides cut steps in the ice.

which we see, but far above it. For this reason the geologists who have examined the ridges most closely are agreed that the peak has lost nearly two thousand feet of its height. It blew its own head off!

Such explosive eruptions are among the worst vices of volcanoes. Every visitor to Naples remembers how plainly the landscape north of Vesuvius tells of a prehistoric decapitation, which left only a low, broad platform, on the south rim of which the little Vesuvius that many of us have climbed was formed by later eruptions. Similarly, here at home, Mt. Adams and Mt. Baker are truncated cones, while, on the other hand, St. Helens and Hood are still symmetrical.

Looking from top of Gibraltar over the Snow-fields to the Summit. Elevation of camera, 12,300 feet. In distance is seen the rim of the Crater. The route to this is a steady climb, with 2,000 feet of ascent in one mile of distance. Many detours have to be made to avoid crevasses. Note the big crevasse stretching away on right—a "Bergschrund," as the Swiss call a break where one side falls far below the other. The stratification on its side shows in each layer a year's snow, packed into ice.

Like Vesuvius, too, Rainier-Tacoma has built upon the plateau left when it lost its head. Peak Success, overlooking Indian Henry's, and Liberty Cap, the northern elevation, seen from Seattle and Tacoma, are nearly three miles apart on the west side of the broad summit. These are parts of the rim of the old crater. East of the line uniting them, and about two miles from each, the volcano built up an elevation now known as Crater Peak, comprising two small adjacent craters. These burnt-out craters are now filled with snow, and where the rims touch, a big snow-hill rises — the strange creature of eddying

Looking up White Glacier, from a point on its lower end, showing vast amount of Morainal Debris carried down by this Glacier. Little Tahoma in middle distance; Gibraltar and Cathedral Rocks on extreme right; Goat Island on left. Elevation of camera, about 4,000 feet.

North Peak, or "Liberty Cap," so called from its resemblance to the Bonnet Rouge of the French Revolutionists. Elevation, about 14,000 feet. View taken from the side of Crater Peak, the easternmost and highest of the three peaks which crown the Summit. Distance, more than two miles.

winds that sweep up through the great flume cut by volcanic explosion and glacial action in the west side of the peak. *

This mound of snow is the present actual top. Believing it the highest point in the United States south of Alaska, the alpinists some years ago named it "Columbia's Crest." The name has stuck, in spite of the fact that the government geographers have adopted, for the Dictionary of Altitudes, the height found by Prof. McAdie, 14,363 feet, thus ranking the Mountain second to Mt. Whitney, in California (14,522 feet).

There are those, however, who refuse to be disabused of their belief that the height of 14,529 feet, found by many scientific investigators as a result of careful barometric observations, is the true altitude. It is probable that scientists will not be content until the question shall have been settled by a competent and impartial commission. For the present, however, I give the official figures. A few feet of height signify nothing. No California peak, hidden away behind the Sierra, can vie in majesty with the Mountain that rises in stately grandeur from the shores of Puget Sound.

The wide area which the Mountain thrusts up into the sky is a highly efficient condenser of moisture. Near to the Pacific as it is, it collects several hundred feet of snow each year from the warm Chinooks, and on all sides this mass presses down, to feed the primary glaciers of the upper slopes. Starting from Paradise, these in order are: Cowlitz and Ingraham glaciers; White

* See illustration on page 28, which shows not only the deep cleft on the west side, but also the three peaks on the summit.

glacier, largest of all; Winthrop glacier, named in honor of Theodore Winthrop, in whose delightful romance of travel, "The Canoe and the Saddle," the ancient Indian name "Tacoma" was first printed; Carbon, North and South Mowich, Puyallup, North and South Tahoma, Kautz and Nisqually glaciers.

The most important secondary glaciers, or "interglaciers," rising below the rock wedges, are Interglacier, Paradise, Stevens, Frying-Pan and Van Trump.

There has been considerable uncertainty as to some of these names, chiefly due to a recent government map. For instance, in that publication, White glacier, most properly so called because it feeds the White river, was named Emmons glacier, after S. F. Emmons, a geologist who made one of the first explorations of the peak. North and South Mowich glaciers, feeding streams similarly named, were miscalled Willis and Edmunds glaciers, after Bailey Willis, geologist, and George F. Edmunds, late United States senator, who visited the Mountain many years ago. South Tahoma glacier was renamed Wilson glacier, for A. D. Wilson, Emmons's companion in exploration. Finally, the name of General Hazard Stevens, who made the first ascent of the peak in 1870, was misplaced, being given to the west branch of the Nisqually, whereas Stevens glacier is the well-defined interglacier adjoining the Paradise on the east.

Such errors in a government document are the more inexcusable because their author ignored names adopted in the original publications of the Geological Survey. The new map prepared by Mr. Ricksecker, and printed herewith, returns to the older and better usage. Unless good reason can be shown for departing from it, his careful compilation should be accepted as authoritative.

The Mountaineers crossing a precipitous slope on White Glacier. Little Tahoma in distance.

Hydro-electric plant at Electron, on the Puyallup river, producing 28,000 h. p.

A word about the industrial value of the Mountain may not be without interest in this day of electricity. It is well known that, within a radius of sixty miles of the head of Puget Sound, more water descends from high levels to the sea than in any other similar area in the United States. The greater part of this is collected on the largest peak. Hydraulic engineers have estimated, on investigation, an average annual precipitation, for the summit and upper slopes, of at least 180 inches, or four times the rainfall in Tacoma or Seattle. The melting snows feed the White, Puyallup and Nisqually rivers, large streams flowing into the Sound, and the Cowlitz, an important tributary of the Columbia. The minimum flow of these streams is computed at more than 1200 second feet, while their average flow is nearly twice that total.

The utilization of this large water supply on the steep mountain slopes began in 1904 with the erection of the Electron plant of the Puget Sound Power Company. For this the water is diverted from the Puyallup river ten miles from the end of its glacier, and 1750 feet above sea level, and carried ten miles more in an open flume to a reservoir, from which four steel penstocks, each four feet in diameter, carry it to the power house 900 feet below. The plant generates 28,000 h. p., which is conveyed to Tacoma, twenty-five miles distant, at a pressure of 60,000 volts, and there is distributed for the operation of street railways, lights and factories in that city and Seattle.

A more important development is in progress on the larger White river near Buckley, where the Pacific Coast Power Company is diverting the water by a dam and eight-mile canal to Lake Tapps, elevation 540 feet above tide. From this great reservoir it will be taken through a tunnel and pipe line to the generating plant at Deiringer, elevation 65 feet. The 100,000 h. p. produced here will be carried fifteen miles to Tacoma, for sale to manufacturers in the Puget Sound cities.

Both these plants are enterprises of Stone & Webster, of Boston. A com-

petitive plant is now under construction by the city of Tacoma, utilizing the third of the rivers emptying into the Sound. The Nisqually is dammed above its remarkable canyon, at an elevation of 970 feet, where its minimum flow is 300 second feet. The water will be carried through a 10,000-foot tunnel and over a bridge to a reservoir at La Grande, from which the penstocks

Building Tacoma's Electric Power Plant on the Nisqually Canyon. Upper view shows site of retention dam, above tunnel; middle view, end of tunnel, where pipeline will cross the canyon on a bridge; lower view, site of the generating plant.

will carry it down the side of the canyon to the 40,000 h. p. generating plant on the river below. The city expects to be able to produce power for its own use, with a considerable margin for sale, at a cost at least as low as can be attained anywhere in the United States. Its success will be largely due to the admirable designs and beginning of construction made under Mr.

Crevasse on Carbon Glacier

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Frank C. Kelsey, former chief engineer.

Admiral Peter Rainier, of the British Navy, in whose honor Captain George Vancouver, in 1792, named the great peak "Mt. Rainier."

The rocks of which the Mountain is composed are mainly andesites of different classes and basalt. But the peak rests upon a platform of granite, into which the glaciers have cut in their progress. Several of the canyons disclose fine outcroppings of the older and harder rock. These are especially clear on the side of the Nisqually, just below the present end of its glacier, as well as on the Carbon and in Moraine Park, which was until recently the bed of a glacier. This accounts for the fact that the river beds are full of granite bowlders, which are grinding the softer volcanic shingle into soil. Thus the glaciers are not only fast deforming the peak. They are "sowing the seeds of continents to be."

Echo Rock, on west branch of Carbon Glacier.

View looking West from Summer Land, one of the great "Parks" between the Glaciers. Far above is Little Tahoma, with Frying-Pan Glacier below it. Gibraltar Rock is seen in the depression. Beyond are Crater Peak and North Peak, on the summit, with the vast snow-field supplying White and Winthrop Glaciers below, and Steamboat Prow and Mt. Ruth on the lower sky-line.

View North from Mt. Ruth (part of the Wedge), with Interglacier in foreground, the Snipe Lake country below, Sour Dough Mountains on right, Grand Park in middle distance, and Mt. Baker and the summits of the Selkirks on the horizon. Elevation of camera, about 8,500 feet.

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View looking across Moraine Park and Carbon Glacier to Mother Mountains.

IV.

THE FLORA OF THE MOUNTAIN SLOPES

By PROF. J. B. FLETT *

Of all the fire-mountains which, like beacons, once blazed along the Pacific Coast, Mount Rainier is the noblest in form. Its massive white dome rises out of its forests, like a world by itself. Above the forests there is a zone of the loveliest flowers, fifty miles in circuit and nearly two miles wide, so closely planted and luxuriant that it seems as if Nature, glad to make an open space between woods so dense and ice so deep, were economizing the precious ground, and trying to see how many of her darlings she can get together in one mountain wreath — daisies, anemones, columbines, erythroniums, larkspurs, etc., among which we wade knee-deep and waist-deep, the bright corollas in myriads touching petal to petal. Altogether this is the richest subalpine garden I ever found, a perfect floral elysium.—John Muir: "Our National Parks."

NO ONE can visit the Mountain without being impressed by its wild flowers. These are the more noticeable because of their high color — a common characteristic of flowers in alpine regions. As we visit the Mountain at a season when the spring flowers of the lowlands have gone to seed, we find there another spring season with flowers in still greater number and more varied in color.

The base of the Mountain up to an altitude of about 4,000 feet is covered by a somber

Anemones

* Prof. Flett knows the Mountain well. He has spent many summers in its "parks," has climbed to its summit four times, has visited all its glaciers, and has made a remarkable collection of its flowers. In addition to the chapter on the botany of the Natural Park, this book is indebted to him for several of its most valuable illustrations.

forest of evergreens composed of the white and black pines; Douglas, lovely and noble firs; the white cedar; spruce, and hemlock. There are found also several deciduous trees—large-leafed maple, white alder, cottonwood, quaking aspen, vine and smooth leafed maples, and several species of willows. Thus the silva of the lower slopes is highly varied. The forest is often interrupted by the glacial canyons, and, at intervals, by fire-swept areas.

A 14-foot Fir, near Mineral Lake

The alpine meadows begin to appear at an altitude of about 5,000 feet. The real alpine trees, with their trim, straight trunks and drooping branches, are in strange contrast to their relatives of the lower altitude. The principal trees of the meadow area are the alpine fir, the alpine hemlock, and the Alaska cedar. These constitute the greater part of the silva of Paradise Valley. There are a few trees of the lovely fir in the lower part of the valley, and a few white-barked pines overlooking the glaciers at timber line.

The trees of the park zone differ greatly on different slopes. On the northeast and east, the white-barked pine and the alpine spruce form no small part of the tree groups. The white-barked pine branches out like the scrub oak on the prairie. It is never seen at a low altitude. The alpine spruce bears numerous cones all over the tree, and has sharp leaves, though not so sharp as its relative, the tideland spruce.

Not only is there a difference in the trees on the different slopes of the Mountain, but there is a marked difference in the herbaceous plants as well. Hesperogenia Strictlandi is a small, yellow plant of the celery family. This is very abundant, both in Spray Park and also in the country east of the

Sunrise in Indian Henry's Park, with view of the Southwest Slope and Peak Success, showing Purple Asters, with bunches of Hellebore in center of Flower Field

An eminent scientist practices the simple life near the Timber Line

Carbon Glacier, but rare on the south side. Gilia Nuttallii, a large, phlox-like plant, is abundant only in the Indian Henry region. Two anemones, one buttercup, three willows and one senecio seem to be confined to the White River country. The moss campion has been found only on Mowich.

The most noticeable and abundant flower on all slopes is the avalanche lily (Erythronium montanum). This plant comes up through several inches of the old snow crust, and forms beautiful beds of pure white flowers, to the exclusion of nearly all other plants. There are often from seven to nine blossoms on a stem. This has other popular names, such as deertongue and addertongue. There is also a yellow species, growing with the other, but less abundant. It seldom has more than one or two flowers on a stem. The yellow alpine buttercup generally grows with the erythroniums. It also tries to rush

Floral Carpet in Indian Henry's Park, where "Mountain Heliotrope," more properly Valerian, and other flowers abound near the snow line

the season by coming up through the snow. The western anemone is a little more deliberate, but is found quite near the snow. It may be known by its lavender, or purple flowers; and later by its large plume-like heads, which are no less admired than the flowers themselves.

The plants just mentioned are the harbingers of spring. Following them in rapid succession are many plants of various hues. The mountain dock, mountain dandelion, and potentilla seldom fail to appear later. The asters, often wrongly called daisies, are represented by several species, some of which blossom early, and are at their best along with the spring flowers. The great majority of the composite family bloom later, and thus prolong the gorgeous array. The lupines add much to the beauty of this meadow region, both at a low altitude, and also in the region above timber line. Their bright purple flowers, in long racemes, with palmate leaves, are very conspicuous on the grassy slopes. Between timber line and 8,500 feet, Lyall's lupine grows in dense silk mats, with dark purple flowers — the most beautiful plant in that zone.

Mountain Asters.

Alpine Hemlock and Mountain Lilies. In the struggle for existence at the Timber Line, Flowers prosper, but Trees fight for life against storm and snow.

Four different kinds of heather are found on the Mountain. The red heather is the largest and the most abundant. It grows at a lower altitude than the others, and is sometimes, erroneously, called Scotch heather.

Looking down from Ptarmigan Ridge into the Canyon of the North Mowich Glacier and up to the cloud-wreathed Peak

Main

Studying the Phlox.

There are two kinds of white heather. One forms a prominent part of the flora, often growing with the red. The other is less conspicuous and grows about timber line. The yellow heather also grows at the same altitude, and is larger and more common than the others. It often forms beautiful areas where other vegetation is rare. The white rhododendron is a beautiful shrub of the lower meadows. Its creamy white blossoms remind one of the cultivated azalea. There are several huckleberries, some with large bushes growing in the lower forest area, others small and adapted to the grassy meadows.

The figwort family has many and curious representatives. The rose - purple monkey-flower is very common and conspicuous in the lower meadows, along the streams. It is nearly always accompanied by the yellow fireweed. Higher up, large meadow areas are arrayed in bright yellow by the alpine monkey-flower. Above timber line, two pentstemons, with matted leaves and short stems with brilliant purple and red flowers, cover large

Squaw Grass, or Mountain Lily
(Xerophyllum tenax)

Mosses and Ferns, in the Forest Reserve, on way to Longmire Springs.

Avalanche Lilies (Erythronium montanum) forcing their way through the snow.

rocky patches, mixed here and there with lavender beds of the alpine phlox; while the amber rays of the golden aster, scattered through these variegated beds, lend their charm to the rocky ridges. The Indian paint-brush, the speedwell, the elephant's trunk, and the pigeon bills are all well-known members of the large figwort family which does much to embellish the Mountain meadows. The valerian, often wrongly called "mountain heliotrope," is very common on the grassy slopes. Its odor can often be detected before it is seen. The rosy spiraea, the mountain ash, and the wild currant, are three common shrubs in this area. There are also numerous small herbaceous plants of the saxifrage family, some forming dense mats to the exclusion of other plants. The mertensias, polemoniums, and shooting stars add much to the purple and blue coloring.

Two liliaceous plants of low altitude are always objects of marked interest. The Clintonia, popularly called alpine beauty, begins in the forest area, and continues up to the lower meadows. This may be known by its pure white blossoms and blue berries. Its leaves are oblong in tufts of from two to four. They spring up near the roots. The other is xerophyllum, mountain lily, sometimes called squaw grass, because it is used by the Indians in basket making. This has tall stems with small fragrant flowers and coarse grass-like leaves.

The writer has a list of about three hundred and sixty species from the Mountain. It includes only flowering plants and ferns. There are more than twenty type species named from the Mountain, not a few of which are found nowhere else. Its geographical position makes it the boundary between the arctic plants from the North and the plants of Oregon and California from the South. Its great altitude has a wonderful effect on plant life. A good example of this is seen upon the trees at timber line, where twenty feet or more of snow rests upon them for many months. Their prostrate trunks and gnarled branches give ample testimony to their extreme struggle for existence. The prevailing wind on the high ridges gives direction to their

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Moraine Park, Sluiskin Mountains and Mystic Lake.

trunks and branches. The latter hang from the leeward side, giving the trees a one-sided appearance. Where the ordinary plants cease to exist the snowy protococcus holds undisputed sway on the extensive snow fields. This is a small one-celled microscopic plant having a blood red color in one stage of its existence. Tourists often wonder what animal has been killed on the snow. On some snow fields and glaciers, it is found associated with a small black angle-worm. The writer has wondered whether the plant furnished food to this little black wiggler in his inhospitable home.

Plant life, on the Mountain, as is well known, does not stop at the snow line. Even in the crater, on the warm rocks of the rim, will be found three or four mosses — I have noted one there which is not found anywhere else — several lichens, and at least one liverwort.

Canada Dogwood (Cornus canadensis)

View of the Mountain from Fox Island, with part of Puget Sound in the foreground. Distance, forty-two miles.

Glacial Debris on lower part of Winthrop Glacier, with Sluiskin Mountains beyond.

V.

THE CLIMBERS

Climb the mountains, and get their good tidings. Nature's peace will flow into you as sunshine flows into trees. The winds will blow their own freshness into you, and the storms their energy, while cares will drop off like autumn leaves.—John Muir.

GIVEN good muscles and wind, the other requisites for an ascent of the Mountain are a competent guide and grit. It offers few problems like those confronting the climber of the older and more crag-like Alps. There are no perpendicular cliffs to scale, no abysses to swing across on a rope.

View of Paradise Valley from Pinnacle Peak, with South-side Route to the Summit. The route starts at Reese's Camp, crosses the snow-fields above Nisqually Glacier, follows the Cowlitz Cleaver nearly to Gibraltar, then turns east to avoid crevasses, passes Gibraltar from East to West, climbs the "Chute" on its West side, and then makes the straightest line the crevasses will permit for Crater Peak.

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The Oldest and the Youngest of the Climbers, Gen. Hazard Stevens and Jesse McRae. General Stevens, with P. B. Van Trump, in 1870, made the first ascent of the Mountain. In 1905, he came west from his home in Boston and joined the Mazamas in their climb. The picture shows him before his tent in Paradise Park. He was then 63 years old.

If you can stand the punishment of a long, steady, up-hill pull, over the ice and loose rocks, you may safely join a party for the summit. But do not try it without guides. The fatal end of Callaghan and Stevens, in 1909, should long serve as a warning against trusting to experience on other mountains. No such wilderness of crevasses and shifting snow slopes should be attacked save in company with those who know its trails.

If one is going the popular route, and is equal to so long and unbroken a climb, he may start from Camp of the Clouds at dawn, and reach the top before noon. But parties frequently go up Cowlitz Cleaver in the evening, and spend the night at Camp Muir, a ledge below Gibraltar, named from the famous mountain climber, John Muir, and offering none of the accommodations of a "camp" save a wind-break. The important thing is to pass Gibraltar early, before the sun starts the daily shower of icicles and rocks from the cliff over the trail. This is the most dangerous point, but no lives have ever been lost here. Everywhere, of course, caution is needed. Overconfidence may prove as costly as it did to Prof. Edgar McClure, of the University of Oregon, who, in 1897, was killed while descending from Camp Muir after dark.

The east-side route involves less danger, perhaps, but is a longer climb over the ice. It has been less used because it is farther from Paradise Valley. Starting from a night's encampment on the Wedge, parties usually require half a day to reach the summit.

The Gibraltar route has been the popular one ever since Gen. Hazard Stevens and P. B. Van Trump, on July 17, 1870, used it in the first successful ascent of the Mountain. Each of these pioneers on the summit has published

P. B. Van Trump, who, with Gen. Stevens, made the first ascent in 1870.

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Amphitheater of Carbon Glacier, the most important example of glacial sculpture upon the Mountain. No other glacier has cut so deeply into the side of the Peak. The Carbon was once two glaciers, separated by a ridge, of which a remnant is still seen in the huge spine of rock extending down from Liberty Cap.

Photo by Lea Bronson

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Avalanche falling on Willis Wall, at head of the great Amphitheater of Carbon Glacier. The Cliff here, up to the Snow Cap visible on the Summit, is more than 4,000 feet high and nearly perpendicular. Avalanches fall every day, but this picture of a big one in action is probably unique in Mountain Photography.

East Side of the Mountain, from the Wedge, showing Route to the Summit over the great White Glacier. This is the easiest and safest of all the routes.

Lateral Moraine of Carbon Glacier. Mountaineers building Trail. Many such Trails have been built, and more are under construction. Without them the "Tenderfoot" would fare badly indeed.

a noteworthy account of how they got there, General Stevens in the Atlantic Monthly for November, 1876, and Mr. Van Trump in the second volume of Mazama. A month after their ascent, they were followed over the same route by Messrs. Emmons and Wilson of the Geological Survey.

Thirteen years before, in 1857, Lieutenant (later General) A. V. Kautz, with several companions, had made the first attempt to scale the peak of which we have any record. He climbed up the arete, or spine, between the glacier now named for him and the Nisqually glacier, but turned back on the approach of night, when probably within a thousand feet of the summit. His route has since been followed successfully to the top by several parties, the first, I believe, being that of Messrs. Glascock

Mountaineers' Camp, Moraine Park, overlooking head of Carbon Glacier.

and Dudley of the Sierra Club, of San Francisco, in 1905. The White glacier route was first used in 1885. In 1891 Mr. Van Trump reached the summit over the ridge dividing the Tahoma glaciers. The first woman to make the ascent was Miss Fay Fuller, of Tacoma, in 1890.

The north and northwest sides, as I have said, are as yet unconquered. Some members of the Mountaineers' Club have a theory that the summit can be reached from Avalanche Camp by climbing along the face of the cliff known as Russell Peak, and so around to the upper snow field of Winthrop glacier. They have seen mountain goats making the trip, and propose to try it themselves. Whether they succeed or not, this trail will never be popular, owing to the landslides caused by the daily ebb and flow of frost in the loose rock of which the cliff is built.

In recounting the famous ascents of the Mountain, a word is due to the work of three well-known clubs of alpinists, the Mazamas, of Portland; the Sierra Club, of California, and the Mountaineers, a later organization, having its headquarters in Seattle and Prof. E. S. Meany of the University of Washington as its en-

Serracs, or Ice Pinnacles, Carbon Glacier.

Looking Southeast from Mt. Rose, above Eunice Lake, with Mother Mountains on right, and Spray Park in distance on left.
Shows outposts of Alpine Firs and Hemlocks on the Timber Line.

Looking from Mt. Rose, Southwest, across Crater Lake to North Mowich Glacier and Mowich Ridge. This was taken from nearly the same place as the preceding view, and at a distance of eight miles from the Mountain.

thusiastic president. The Mazamas have made two ascents, with large parties, and each of the other clubs has made one. Many members of the Appalachian Club and of European organizations of similar purpose have climbed to Crater Peak, either in company with the Western clubs named, or in smaller parties.

All of these clubs have done much to make the Mountain better known. Each of the Coast societies publishes a periodical. The numbers of these publications describing the ascents by the clubs are of scientific value as well as popular interest.

An excellent, though incomplete, bibliography, prepared by Miss Mary Banks, may be found in the Mountaineer for November, 1909. It covers the important scientific publications on the Mountain thoroughly, and cites a large number of magazine articles. The list of publications hitherto wholly devoted to the subject is a very brief one, the chief titles, outside of books of pictures alone, being James Wickersham's pamphlet on the name ("Is it 'Mt. Tacoma' or 'Rainier,'" Tacoma, 1893), Olin D. Wheeler's "Climbing Mt. Rainier," St. Paul, 1901, and Fred G. Plummer's "Illustrated Guide Book to Mt. Tacoma," Tacoma, no date.

I close this brief essay with expert testimony. In 1883, Prof. Zittel, the German scientist, and Prof. James Bryce, long president of the British Alpine Club, author of "The American Commonwealth," and now British ambassador to the United States, explored our great

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Spray Falls, a splendid scenic feature of the North Side, where it drops more than five hundred feet from the Spray Park table-land into the Canyon of North Mowich Glacier.

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The Mountain, as seen from a high ridge in the Cascades near Green River Hot Springs, showing the North and East faces of the Peak.

peak. Later, these famous mountain climbers united in publishing a note on their impressions. They said, in part:

The scenery is of rare and varied beauty. The peak itself is as noble a mountain as we have ever seen, in its lines and structure. The glaciers which descend from its snow fields present all the characteristic features of those in the Alps, and though less extensive than the ice streams of the Mount Blanc or Monta Rosa groups, are in their crevasses and serracs equally striking and equally worthy of close study.

We have nothing more beautiful in Switzerland or Tyrol, in Norway or in the Pyrenees, than the Carbon river glaciers and the great Puyallup glaciers. Indeed, the ice in the latter is unusually pure, and the crevasses are unusually fine. The combination of ice scenery with woodland scenery of the grandest type is to be found nowhere in the Old World, unless it be in the Himalayas, and, so far as we know, nowhere else on the American continent.

Returning from the Summit. The Mountaineers ending a memorable outing in 1909. Winthrop Glacier in foreground, Sluiskin Mountains in distance.

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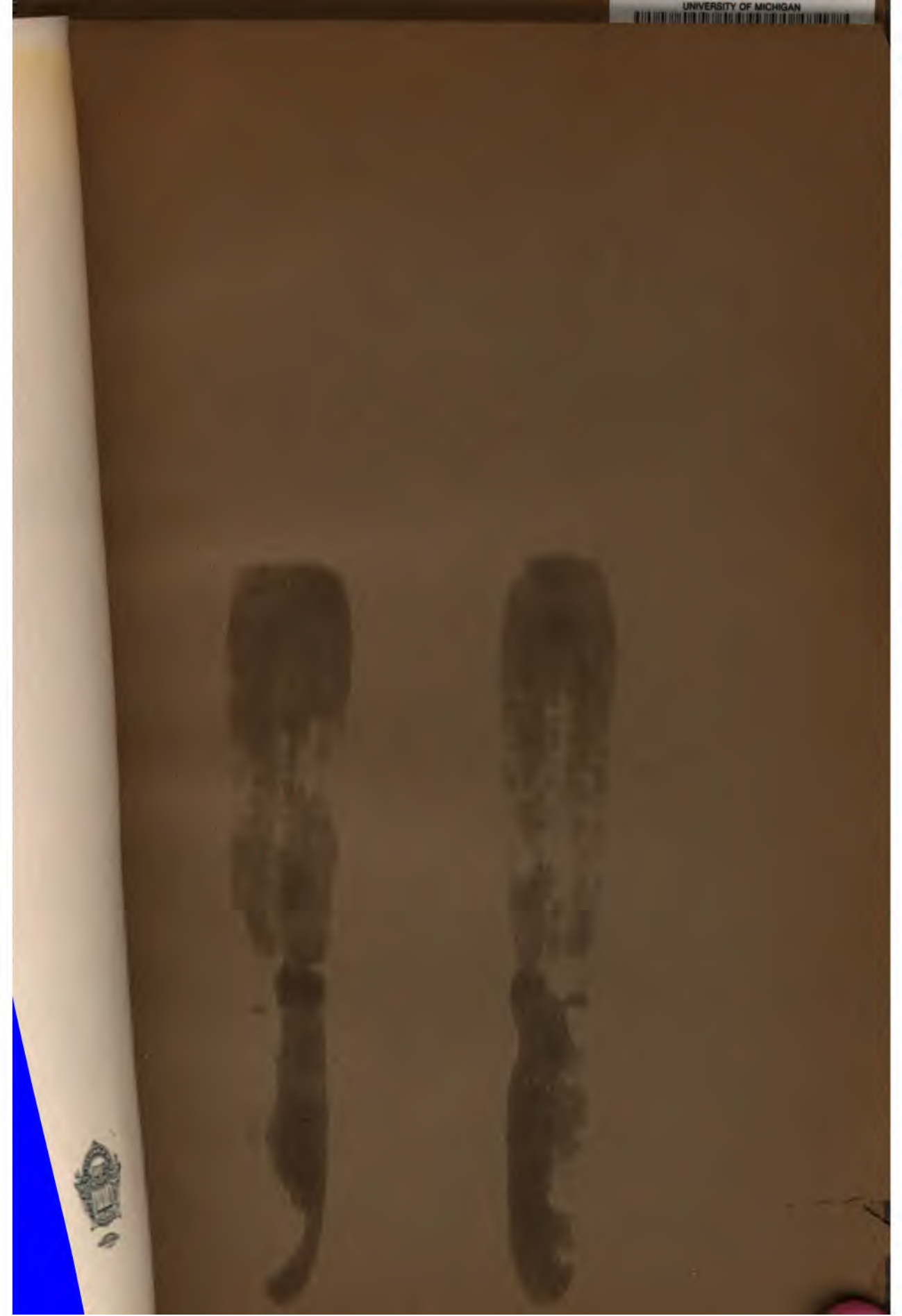

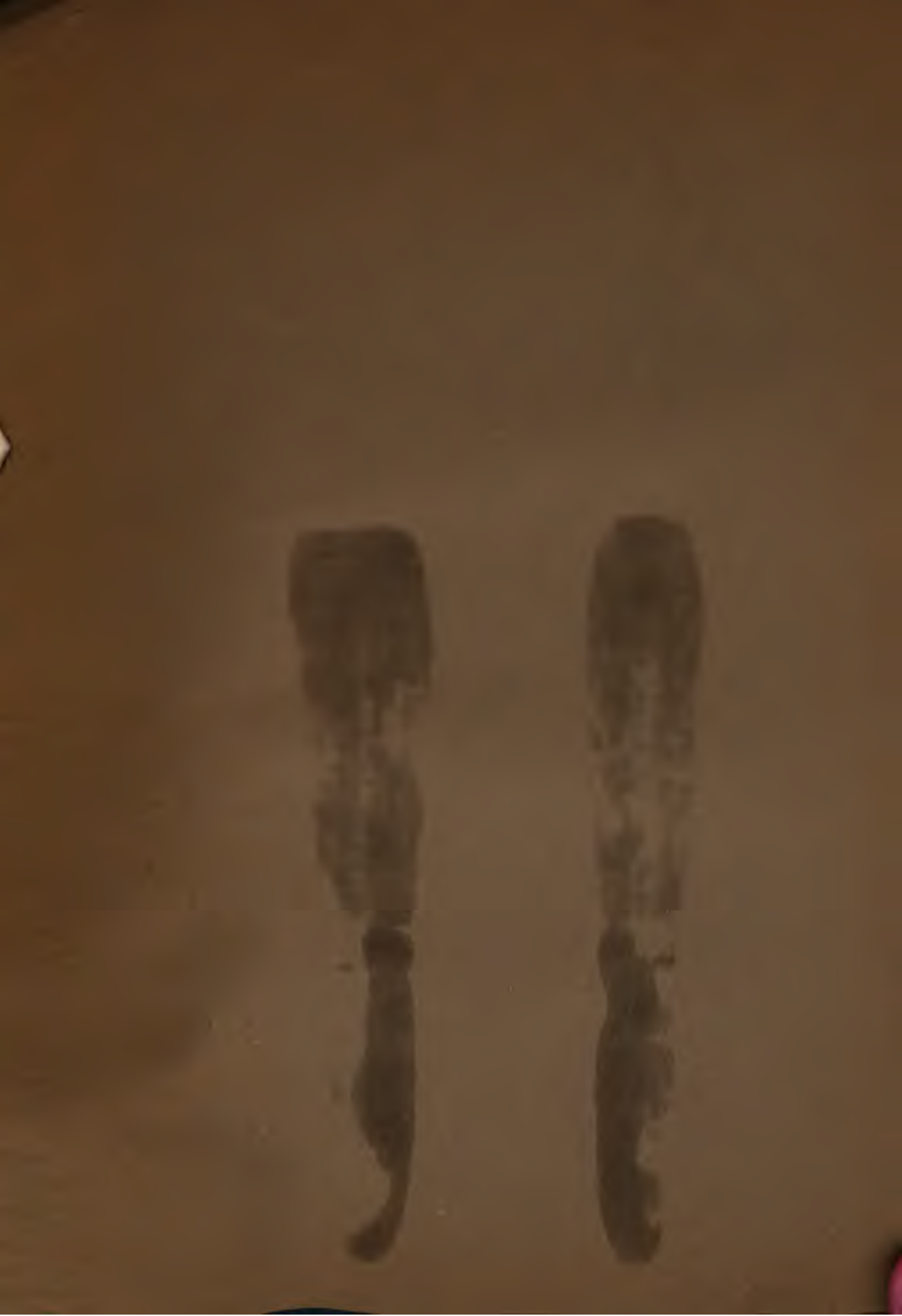

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